DOPAMINE AGONISTS IN ANIMAL MODELS OF PARKINSON'S DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: Parkinson’s disease (PD) is a severely disabling condition with limited effective therapies. In animal models of other neurological conditions, study quality is a potential source of bias which leads to an overstatement of drug efficacy.

Aims: To describe the reported efficacy of dopamine agonists in animal models of PD using systematic review and meta-analysis and to examine any impact of study quality and design.

Methods: Relevant publications were identified by electronic searching of three online databases. Data were extracted for neurobehavioural outcome, for study design and for reported study quality. Standardised mean difference meta-analysis was used to provide summary estimates of efficacy, with the effects of study quality and study design explored using stratified meta-analysis.

Results: 253 publications reported the use of a dopamine agonist in an animal model of PD and of these 121 publications reported data suitable for inclusion in meta-analysis. In all, 47 interventions were tested in 601 comparisons which used 4181 animals. Overall, neurobehavioural outcome was improved by 1.10 standard deviations (SD; 95% Confidence Interval (CI) 0.99-1.22). Reporting of measures to reduce bias was low and publications which reported the blinded assessment of outcome had significantly smaller effect sizes (0.85, 95% CI 0.64-1.07) than those which did not (1.18, 95% CI 1.05-1.31, p< 0.005).

Conclusions: This systematic review of dopamine agonists in animal models of PD has identified that study quality may be a potential source of bias in the reported efficacy. This approach provides a framework for future preclinical and clinical trials.